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| 10/681,138 | 10/09/2003 | Mitsunobu Niwa | 2635-184 | 6457 |
| 23117 7590 11/12/2008 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203 | | | | |
| EXAMINER | | | | |
| OLSEN, KAJ K | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/681,138

Applicant(s)

NIWA, MITSUNOBU

Examiner

KAJ K. OLSEN

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-43 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 28-43 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/CDC)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 30, 31, and 33-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
3. New claim 30 specifies that the completion of activation of the second is determined when a predetermined time has elapsed after the second current flowing in the second cell is in a predetermined range. The examiner does not believe applicant has support for this combination of the predetermined time *and* the second current being in a predetermined range. In particular, fig. 6 shows that the second cell can be determined to be active a predetermined time after the element admittance reaches a particular k value (steps S121 and S122). However, the specification makes clear that this admittance is for the A/F cell, which is the first cell of claim 30 (p. 18, ll. 3-18). The specification further states that instead of the scheme shown in fig. 6, one could also rely on the second cell current for the determination of activation. See p. 21, l. 23 - p. 22, l. 6. However, there is nothing in the specification to suggest this alternative embodiment would also rely on a predetermined time period as well. In other words, the

specification states that one could determine the activation of the second cell either by waiting a predetermined time after the first cell is activated (fig. 6) or one could just measure the activation of the second cell directly (p. 21, l. 23 - p. 22, l. 6). There is nothing in the specification to suggest one could both measure the activation of the second cell *and* wait a predetermined time after that, nor is it clear why one would even want to do that. If you have already directly determined that the second cell is activated (i.e. the second current is in a predetermined range), then why would one wait an additional time after that for the determination of its activation? The reason for the predetermined time in the fig. 6 embodiment is because the second cell is not activated at the same time as the first cell and a delay (i.e. predetermined time) is necessary. No similar delay would appear to be necessary if you are measuring the activation of the second cell directly and the originally filed disclosure also gives no indication of such a delay. Hence, new claim 30 is not enabled by the originally filed disclosure.

4. Claim 31 lacks support in the originally filed disclosure for similar reasons as claim 30. In particular, although applicant has support for waiting a predetermined time period after activation of the first cell (fig. 6 and p. 18, ll. 3-18) and applicant has support for determining the activation based on the third cell being in a predetermined range (p. 21, l. 23 - p. 22, l. 6), applicant does not appear to have original disclosure support for the use of a predetermined time elapsing after the third cell current is in a predetermined range, nor as discussed above is there any obvious reason for waiting once the current is already in a predetermined range.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 28-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. In claims 28, 30, and 31, there is no antecedent basis for “the first signal” (claims 28, 30, and 31) or “the second signal” (claim 28).

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
9. Claims 28, 29, 32, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al (US 2002/0104758 A1) in view of Kawase et al (USP 6,453,724) and Kawanabe et al (USP 4,808,269).
10. Mizutani discloses a gas sensor comprising a first cell 2 for detecting a concentration of oxygen that has a first chamber 7a and a pair of electrodes (2a, 2b) that discharge or pump in oxygen in the measurement gas introduced from an external space which outputs a first electric current indicating a concentration of oxygen in the measurement gas. See fig. 9(a) and 10 and para. 0081 and 0095. Mizutani further discloses a second cell 4 for detecting a concentration of a specific gas component (NO_x) in the pumped measurement gas where the second cell has a second chamber 7b and a pair of second electrodes (4a, 4b) to decompose the specific gas component to output a second electric current indicating a concentration of the gas. See fig. 9(b) and para. 0083. Mizutani further discloses a heater 14 for heating up the at least one first and second cells (para. 0077). Mizutani does not explicitly disclose the presence of a controller for

determining the completion of activation of the first and second cells. Kawase discloses in an alternate NO_x sensor that these sensors are very temperature dependent (fig. 8) and that it is necessary to control the activation of the sensor to ensure that both the first cell 110 and second cell 120 are going to provide accurate measure of the O₂ and NO_x in measurement gas. Kawase teaches controlling the activation by first determining that the first cell 110 (equivalent in function to cell 2 of Mizutani) is activated at a first time moment t11 followed by determining that the second cell 120 (equivalent in function to cell 4 of Mizutani) is activated at a second time moment t12 different from the first time moment. See fig. 17 and 19 col. 17, ll. 25-40. In other words, at time t11, the temperature of the pump cell reaches 650°C and the flag for the pump cell (FPS) is set to 1, indicating that the pump cell is considered to be activated. After FPS is set to 1, a 30 second delay is executed before the sensor cell is considered to be activated (i.e. flag FSS is set to 1). This would appear to be equivalent to what the instant invention is doing, namely utilizing a first decision of activation from one cell and having the second decision of activation be some predetermined time period from the first decision. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Kawase for the sensor of Mizutani so that the first and second cells are determined to be appropriately activated prior to use of the sensor. Although Kawase does not rely on a first time moment that is a predetermined period of time from when electric power has been supplied to the heater, Kawanabe teaches that first cell activation can be determined by making sure a predetermined time T_{FB} since heater energization elapses before the cell is deemed to be activated. See Kawanabe abstract and fig. 7. This avoids the application of pump current to the cell electrodes prior to activation (which was explicitly avoided by Kawanabe) so as to avoid

deterioration due to said pump current, which is something the technique of Kawase cannot avoid (i.e. current must be applied in order to measure the first cell impedance). See fig. 7 and col. 8, ll. 1-32. Because the method of Kawanabe determines activation without having to apply voltage to the electrodes when the sensor is not activated, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Kawanabe for the method and apparatus of Kawase so as to avoid first cell deterioration that might be caused by voltage being applied prior to sensor activation. Moreover, the technique of Kawanabe is simpler to implement than the activation estimation of Kawase (i.e. Kawanabe requires a simple time delay instead of the repeated temperature measurements of Kawase) and the substitution of a simpler activation estimation would have required only routine skill in the art.

11. With respect to claim 29, the 30 seconds of Kawase is a predetermined period of time after the activation of the first cell.
12. With respect to claim 32, whether or not the predetermined time of Kawase was based on the time needed to discharge oxygen does not further define the actual time period or further define the controller itself.
13. With respect to claim 42, see para. 0075 and 0083 of Mizutani.
14. With respect to claim 43, see para. 0082 of Mizutani.

Response to Arguments

15. Applicant's arguments with respect to claims 28-43 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
November 11, 2008